

Workplace Stress, Mental Health, and Burnout of Veterinarians in Australia.

P. H. Hatch¹, H. R. Winefield², B. A. Christie³, and J. J. Lievaart⁴.

¹P. H. Hatch, Hatch Counselling and Consultancies, P.O. Box, 1450, Wodonga Victoria

²H. R. Winefield, Faculty of Health Sciences, University of Adelaide, Adelaide, South Australia

³B. A. Christie, School of Animal & Veterinary Science, Charles Sturt University, Wagga Wagga, NSW.

⁴J. J. Lievaart, E.H. Graham Centre for Agricultural Innovation (an alliance between Charles Sturt University and NSW Department of Industry and Development), Wagga Wagga, NSW.

Abstract

Objective The aim of the present study was to determine the frequency of the states of depression, anxiety, stress and burnout using internationally validated methods and to relate these to demographic characteristics of veterinarians.

Methodology A postal survey of registered veterinarians with at least one year's experience and whose address was available were mailed and 1947 returned the questionnaire providing data for analysis.

Results Overall veterinarians suffer more psychological distress including higher levels of depression, anxiety, stress and burnout. The severity of these states was determined by gender, background, type of practice and years after graduation.

Conclusion Modifying curricula of veterinary schools to include the teaching of personal cognitive and coping skills to undergraduate veterinary students, and the provision of the opportunity to enhance these skills throughout the veterinary career and changes in the veterinary workplace could result in improved mental health and increased job engagement and work satisfaction.

Keywords

Veterinarians, Depression, Anxiety, Stress, Burnout.

Introduction

Few formal studies of veterinarians' occupational stress, mental health and burnout or its antithesis job engagement have been reported. A self diagnosis burnout scale reported that 67% of female veterinarians showed clear signs of burnout and a previous study demonstrated that 53% of male veterinarians were

also in this category {Elkins, 1992 #1}. A survey of Finnish veterinarians focussed on occupational stress and burnout found 40% suffer mild burnout, being higher in the less than 45 year old group and 73% were rather or very stressed {Hansez, 2008 #3}. A Belgian study of bovine practitioners reported 15% suffered high levels of emotional exhaustion, a key component of burnout {Maslach, 2001 #13} {Kristensen, 2005 #12}.

Anecdotally Australian veterinarians are stressed and burned out but no empirical studies using validated questionnaires have been reported. A random survey in which 313 veterinarians responded (39% response rate) found levels of stress varied with individuals but the overall stress level was moderate and concluded “work-related stress could not be described as a problem endemic to Australian veterinarians on the basis of that survey” {Davis, personal communication}. The Kessler K10, a measure of psychological distress demonstrated that veterinarians were twice as distressed as the general population in a study of workplace injuries and suicide (Fairnie, Personal communication). A survey of small animal veterinarians concluded that this subset was prone to job stress {Meehan, 2007 #4}. A survey of veterinarians who graduated from Australian Veterinary Schools between 1960 and 2000 reported one third as having poor psychological health and job-related anxiety but depression was not high however some did report distress. No relationship was found between type of practice and mental health {Fritschi, 2009 #5}. The General Health Questionnaire 12 (GHQ12) was used in this survey as the measure of psychological distress but it measures transient affect not chronicity and lacks discriminatory power in detecting cases and non-cases in the depression anxiety spectrum {Australian Bureau of Statistics, 2008 #21}. A longitudinal study of University of Queensland graduates postulated that new graduates are “suffused with idealistic enthusiasm” but suffered a gradual loss of idealism, energy and commitment over time shortening their careers as veterinarians. The progression through disillusionment, fatigue, frustration, and mental anguish to feelings of incompetence, helplessness and hopelessness is reported to be embraced by the concept of burnout” {Heath, 2001 #10}.

The core element of burnout is exhaustion resulting from the interaction of the individual and workplace stress. The Copenhagen Burnout Inventory (CBI) focuses on exhaustion in three life domains; personal burnout, work-related burnout and client related burnout. Personal burnout is defined as “the degree of physical and psychological fatigue and exhaustion experienced by a person”; work related burnout as “the degree of physical and psychological fatigue and exhaustion experienced by a person as related to his/her work”; and client related burnout as “the degree of physical and psychological fatigue and exhaustion experienced by a person as related to his/her work with clients” {Kristensen, 2005 #12}. Each individual experiences burnout in their own unique way, often describing emotions of frustration, lack of enthusiasm, overwhelmed, overloaded, over worked and trapped. The basic themes are an erosion of emotions and a problem of fit between the person and the job. Six mismatches have been identified to impact on well being and are: work overload, lack of control, insufficient reward (both intrinsic and extrinsic), breakdown in community, absence of fairness, and conflicting values in the workplace {Maslach, 1997 #16}. With the exception of the burnout study of Belgian veterinarians {Hansez, 2008 #3} valid comparisons cannot be made with any other international study. The detrimental effect of work place burnout is not restricted to the individual but impacts on the workplace. For the individual as negativity increases, productivity decreases increasing the work load of others and thus precipitating their burnout. A noteworthy outcome for the business is not only decreased productivity but decreased profitability. Prevention of burnout requires the identification of the stressors involved and managerial changes to decrease the effects of those stressors.

The aims of this study were twofold, to determine the frequency of depression, anxiety and stress states and burnout in the Australian veterinarians using validated measures. The second was to determine the relationship of the factors of gender, school of graduation, life experience before entering university, current role and type of veterinary work now performed to the psychological states. This paper reports a survey of Australian veterinarians using two measures of psychological health, namely the Kessler K10 (K10), the Depression, Anxiety and Stress Scales (DASS) and one of burnout, the Copenhagen Burnout Inventory (CBI) and their relationship to the demographic data.

Materials and Methods.

The 2006 veterinary rolls were used to create a database of names and addresses of veterinarians who graduated before 2005 with the exception of the Northern Territory (2004 roll) and Tasmania (Yellow pages telephone directory). Veterinarians whose address was not included were deleted along with those with an overseas address. Veterinarians with duplicate registrations in two or more jurisdictions were identified and the address coinciding with the State roll was retained. Basic demographic data is not collated throughout Australia with the exception of The New South Wales Veterinary Practitioners Board {, 2008 #42}.

Mental health was measured by the Kessler K10 and the DASS and burnout by the Copenhagen Burnout Inventory.

The Kessler K10 was developed to screen for non-specific psychological distress (mental disorders) using the modern psychometric item response theory and was constructed to have consistent severity ratings across demographic sub-samples being sensitive in the 90th to 99th percentiles range to discriminate between community cases and non-cases as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) {Kessler, 2002

#38} The usefulness of the K10 as broad gauged screening tool for mental disorders has been reported ¹¹. The 1997 Australian Survey of Mental Health and Wellbeing demonstrated that the Kessler K10 outperformed the GHQ12 as a measure of nonspecific mental health and was selected for inclusion in the 2001 population Health survey¹². Analysis of the 2001 database found gender and educational bias effects to be small adding further to the validity of the Kessler K10 in epidemiological studies of mental health ¹³.

The DASS was initially developed to define and measure the core features of the constructs of depression and anxiety and to measure those states, but a third construct emerged and that was stress. The DASS is unique as its development was on normal Australian subjects prior to being trialled in the clinical situation. An important finding was the major difference between non-clinical and clinical subjects was one of severity ¹⁴. Depression is characterised by loss of self worth and is broader than just sadness of mood but is associated with a perception that important life's goals will not be attained. The anxiety scale emphasises the enduring state of anxiety and the acute response to fear the latter also being included in some other self report scales. The scales give weight to somatic and subjective symptoms and situational anxiety. The stress scale measures a state of persistent arousal with a low threshold for becoming upset or frustrated but further research is needed to clarify the external validity of the scale in relation to life events, appraisal and coping and its separation from anxiety. There is an association between depression and anxiety demonstrated by a positive correlation. This correlation may indicate a common cause of

anxiety and depression and stress i.e. an individual vulnerability factor and a common environmental activation factor¹⁴. The 21 item short form DASS 21 was used in this study.

The first study of burnout in Danish workers (PUMA study: Project on Burnout, Motivation and Job Satisfaction) found that the de facto gold standard for measuring burnout, the Maslach Burnout Inventory was unsatisfactory leading to the development and validation of new tool, The Copenhagen Burnout Inventory. Schaufeli and Greengrass, Pines and Aronson and Sharon all emphasise that the core of burnout is fatigue and exhaustion. The CBI is focussed on these core elements and attributes these to domains or spheres in an individual's life. It consists of three parts, a generic part: personal burnout, work-related burnout and client related burnout. Personal burnout is defined as the degree of physical and psychological fatigue and exhaustion experienced by a person. Work-related burnout as the degree of physical and psychological fatigue and exhaustion that is perceived by that person as related to his/her work. Client burnout is defined as the degree of physical and psychological fatigue and exhaustion that is perceived by that person as related to his/her work with clients. By comparing the scale for personal burnout to work related burnout individuals can be identified who attribute their fatigue to non-work factors (health or family demands) likewise client burnout examines the connection to "people work"¹⁵.

The data from the questionnaires were entered into an Excel (Microsoft Office 2007) spreadsheet prior to being transferred to PASW18 (SPSS inc.) for descriptive analysis and significance testing of the categories related to non specific psychological distress (K10), depression, anxiety and stress (DASS) and Burnout (CBI). A multivariate logistic regression model (SPSS 14) was used to determine the factors affecting the extreme categories in the DASS (severe and extremely severe categories), The K10 (high and very high categories) and Burnout scores over 50. The factors included were; gender, background, type of practice/work, and years after graduation. To select the best model a backward selection (Wald selection criteria) was used and factors were excluded at a P value of 0.10.

The survey was voluntary and anonymous. Ethics approval was received from the University of Adelaide Human Research Ethics Subcommittee.

Results.

Of the 6991 survey questionnaires posted a total of 2018 were returned of which 2004 were completed. Retired and non practicing veterinarians were excluded along with four received after the data was compiled leaving 1947 with useable data. 1000 (51.4%) were male and 947 (48.6%) were female. All veterinary schools were represented 566 (29.1) from the University of Queensland, 562 (28.9%) University of Sydney, 377 (19.4%) University of Melbourne, 287 (14.7%) and 155 (8.0%) graduating from overseas Universities. 1008 veterinarians had a capital city background, 575 were from rural cities or towns and 364 had a rural or agricultural background. 1020 were in companion animal practice, 31 large animal practice, 420 in mixed animal practice, 127 in consultancy/specialist practice, 85 equine practice and 264 in salaried positions (includes research, teaching, industry and government administrative positions). Of the veterinary practitioners 834 were assistant/associate veterinarians and 794 were practice principals or partners.

Psychological Distress

Kessler K10 scores.

Reference baseline data is from the 2001 ABS Health Survey of the Australian population. The scores were divided into four rankings low (10-15), moderate (16-21), high (22-29) and very high (30-50). These same rankings are used in this report to provide a comparison between veterinarians and the Australian population. Veterinarians' scores were weighted more to the moderate, high and very high levels of psychological distress. Female veterinarians tended to score higher than their male cohorts. Those with a farm or rural enterprise background were underrepresented in the very high category compared to those from capital city or a rural town or city. There is a slow decrease in scores in the high and very high categories with increasing years from graduation but an increase in the very high category after twenty years. Consultancy/ specialist and large animal practitioner scores approached the baseline reference scores but very high scores occurred more frequently in companion animal and mixed animal practitioners along with salaried veterinarians (includes teaching, research, government administrative and industry veterinarians). For practitioners practice principals/partners scores were weighted to the moderate category but associate (assistant) veterinarian's scores were higher in the moderate, high and very high categories (Table 1).

Table 1: The Kessler K10 percentages of veterinarians and significant differences in each class.

		K 10 categories				Total N**
		Low*	Moderate*	High*	Very high*	
REFERENCE BASELINE DATA %		64.3%	23.0%	9.0%	3.6%	
All respondents		711(35.2%)	848(42%)	283(14%)	102(5%)	1944
Gender	Male	450(45.1%)	400(40.1%)	100(10.0%)	47(4.7%)	997
	Female	261(27.6%)	448(47.3)	183(19.3%)	55(5.8%)	947
Background	Capital City	350(34.8%)	444(44.2%)	155(15.4%)	56(5.6%)	1005
	Rural City/Town	195(34.0%)	265(46.2%)	76(13.2%)	38(6.6%)	574
	Farm	166(45.5%)	139(38%)	52(14.2%)	8(2.2%)	365
Year after graduation	< 5years	55(20.7%)	127(47.7%)	64(24.1%)	20(7.5%)	266

	5 - 10 years	72(25.6%)	137(48.8%)	54(19.2%)	18(6.4%)	281
	11- 15 years	121(37.6%)	138(42.9%)	47(14.6%)	16(5.0%)	322
	16 - 20 years	87(28.2%)	177(57.3%)	35(11.3%)	10(3.2%)	309
	> 20 years	376(45.5%)	329(39.8%)	83(10.0%)	38(4.6%)	826
Type of practice/work	Companion. Animal	354(34.8%)	449(44.1%)	158(5.6%)	57(5.6%)	1018
	Large Animal	19(61.3%)	10(32.3%)	2(6.4%)	0(0.0%)	31
	Mixed	142(33.9%)	188(44.9%)	68(16.2%)	21(5.0%)	419
	Consultancy/Specialist	65(51.2%)	46(36.2%)	10(11.8%)	3(2.4%)	127
	Equine	34(40.0%)	34(40.0%)	10(11.8%)	7(8.2%)	85
	Salaried	97(36.7%)	121(45.8%)	32(12.1%)	14(5.3%)	264
Professional relationship	Principal	392(52.5%)	241(32.2%)	87(11.7%)	27(3.6%)	750
	Associate	314(35.9%)	336(38.4%)	166(18.9%)	60(6.8%)	875

* Percentage per category ** Total number of respondents in each category

Significant differences occur between male and female veterinarians ($\chi^2 = 83.9$, $p=0.000$); capital city and rural city or town backgrounds ($\chi^2=2.26$, $p=0.001$), capital city and farm background ($\chi^2=20.2$, $p=0.000$), and rural city or town and farm background ($\chi^2=20.2$, $p=0.000$). Significant differences occurred depending on the years from graduation; those graduated less than five years differed significantly from those graduated eleven to fifteen years ($\chi^2=23.1$, $p=0.000$), sixteen to twenty years ($\chi^2=24.2$, $p=0.000$) and more than twenty years ($\chi^2=67.1$, $p=0.000$); those graduated five to ten years differed from those graduated eleven to fifteen years ($\chi^2=10.3$, $p=0.016$), from those sixteen to twenty years ($\chi^2=10.5$, $p=0.009$) and those graduated more than twenty years ($\chi^2=67.1$, $p=0.000$); those graduated eleven to fifteen years differed significantly from those more of than twenty ($\chi^2=8.2$, $p=0.042$) and those graduated sixteen to twenty years differed from those more than twenty years ($\chi^2=33.3$, $p=0.000$). Significant differences in type of practice/work occurred

between companion animal and large animal ($\chi^2=10.3$, $p= 0.016$), consultancy/specialist ($\chi^2=16.9$, $p= 0.001$); between large animal and mixed practice ($\chi^2=10.4$, $p= 0.015$) and salaried veterinarians ($\chi^2=7.82$, $p= 0.050$). Principal and associate veterinarians differ significantly ($\chi^2=51.5$, $p= 0.000$).

The DASS-depression scores.

Overall the depression scores are higher in the moderate, severe and extremely severe categories in comparison to the reference baseline data. Female veterinarians are more depressed than their male counterparts however both sexes are in the extremely severe category by a factor of two. Likewise those from a capital city, rural city or town have significantly higher scores in the moderate, severe and extremely severe categories. The first five years after graduation have higher scores in the categories mild to extremely severe compared to other groups however the percentage classified as extremely severe varies across the years with peaks occurring at less than five years at five to ten years and again at more than twenty years. With the exception of large animal practitioners all groups are more depressed than reference baseline data, the most depressed being salaried and equine veterinarians (table 2).

Table 2 Depression

		DASS Depression categories					Total N**
		Normal*	Mild*	Moderate*	Severe*	Extremely Severe*	
Reference Baseline data %		78%	9.0%	8.0%	3.0%	2.0%	
All respondents		1446(74.5%)	154(7.9%)	194(10%)	73(3.8%)	75(3.9%)	1942
Gender	Male	775(77.7%)	60(6.0%)	89(8.9%)	37(3.9%)	37(3.7%)	997
	Female	671(71%)	94(9.9%)	105(11.0%)	37(3.9%)	38(4.0%)	945
Background	Capital City	733(73.0%)	90(9.0%)	102(10.2%)	37(3.7%)	41(4.1%)	1003
	Rural City/Town	524(72.0%)	42(7.3%)	54(9.4%)	25(4.4%)	28(4.9%)	590
	Farm	288(78.9%)	22(6.0%)	38(10.4%)	11(3.0%)	6(1.6%)	365
Years after graduation	< 5years	177(66.3%)	35(13.5%)	28(10.5%)	15(5.6%)	12(5.0%)	267
	5 - 10 years	196(69.5%)	26(9.2%)	41(14.5%)	8(2.8%)	11(3.9%)	282

	11- 15 years	249(77.8%)	17(5.3%)	29(9.0%)	12(3.8%)	11(3.9%)	320
	16 - 20 years	192(77.1%)	20(8.0%)	20(8.0%)	11(6.1%)	6(2.4%)	308
	> 20 years	632(76.7%)	56(6.8%)	76(9.2%)	27(3.3%)	33(4.0%)	824
Type of practice/ work	Companion Animal	741(72.7%)	89(8.7%)	114(11.2%)	35(3.4%)	40(3.9%)	1018
	Large Animal	27(87.0%)	1(3.2%)	1(3.2%)	2(6.6%)	0(0.0%)	31
	Mixed	319(76.1%)	31(7.4%)	40(9.5%)	15(3.6%)	14(3.3%)	419
	Consultancy/ Specialist	109(85.8)	1(0.8%)	8(6.3%)	4(3.1%)	5(3.9%)	127
	Equine	61(71.8%)	7(8.2%)	7(8.2%)	6(7.1%)	4(4.7%)	85
	Salaried	190(72.5%)	25(9.5%)	24(9.2%)	11(4.2%)	12(4.6%)	262
	Professional relationship	Principal	617(78.0%)	52(6.6%)	78(9.9%)	25(3.2%)	19(2.4%)
Associate		588(70.5%)	75(9.0%)	93(11.2%)	37(4.3%)	41(4.9%)	834

*Percentage in each class ** Total number of respondents

Significant differences occur between male and female veterinarians ($\chi^2=14.9$, $p= 0.005$), between graduated less than five years and more than twenty years ($\chi^2=15.9$, $p= 0.003$), companion animal practitioners and consultant/specialists ($\chi^2=14.3$, $p= 0.007$), between mixed animal practitioners and consultant/specialists ($\chi^2=9.7$, $p= 0.045$) and between consultant/specialists and equine veterinarians ($\chi^2=10.7$, $p= 0.030$) and salaried veterinarians ($\chi^2=13.0$, $p= 0.011$). A significant difference occurs between principal and associate veterinarians ($\chi^2=13.7$, $p= 0.008$).

DASS –anxiety scores.

Overall the percentage of veterinarians classified as anxious is less than the reference baseline data however females tend to be slightly more anxious. Overseas, Murdoch University and University of Sydney graduates are overrepresented in the extremely severe category along with those with capital city

and rural town or city backgrounds. There are two periods, less than five years and eleven to fifteen years after graduation when anxiety is highest in the extremely severe classification. Companion animal and associate (assistant) veterinarians are also increased in the extremely severe classification (Table 3).

Table 3 Anxiety

		DASS Anxiety categories					Total N**
		Normal*	Mild*	Moderate*	Severe*	Extremely Severe*	
Reference Baseline Data %		78%	9.0%	8.0%	3.0%	2.0%	
All respondents		1618(83.3%)	90(4.6%)	151(7.8%)	42(2.2%)	41(2.1%)	1942
Gender	Male	873(86.7%)	43(4.3%)	52(5.2%)	13(1.3%)	16(1.6%)	997
	Female	745(78.8%)	47(5.0%)	99(10.5%)	29(3.1%)	25(2.6%)	945
Background	Capital City	820(81.8%)	59(5.9%)	76(7.6%)	23(2.3%)	25(2.5%)	1003
	Rural City/Town	469(81.&%)	18(3.1%)	53(9.2%)	18(3.1%)	16(2.8%)	590
	Farm	329(90.1%)	13(3.6%)	22(6.0%)	1(0.3%)	0(0.0%)	365
Years after graduation	< 5years	199(74.5%)	15(5.6%)	34(12.7%)	10(3.7%)	9(3.9%)	267
	5 - 10 years	215(77.3%)	15(5.6%)	32(11.3%)	11(3.9%)	4(1.4%)	282
	11- 15 years	279(77.8%)	7(2.2%)	20(6.3%)	5(1.6%)	9(2.8%)	320
	16 - 20 years	208(83.5%)	16(6.4%)	18(7.2%)	4(1.6%)	3(1.2%)	308
	> 20 years	714(86.7%)	35(4.2%)	47(5.7%)	12(1.6%)	16(1.9%)	824
Type of practice/ work	Companion. Animal	826(81.0%)	56(5.5%)	84(8.3%)	26(2.6%)	26(2.6%)	1018
	Large Animal	29(93.5%)	0(0.0%)	1(3.2%)	1(3.2%)	0(0.0%)	31
	Mixed	349(83.3%)	18(4.3%)	38(9.1%)	8(1.9%)	6(1.4%)	419

	Consultancy/ Specialist	115(91.4%)	2(1.6%)	5(3.9%)	3(2.4%)	2(1.6%)	127
	Equine	71(83.5%)	4(4.7%)	6(7.1%)	0(0.0%)	4(4.7%)	85
	Salaried	228(87.0%)	10(3.8%)	17(6.5%)	4(1.5%)	3(1.1%)	262
Professional relationship	Principal	681(79.0%)	43(5.4%)	43(5.4%)	9(1.1%)	15(1.9%)	791
	Associate	659(79.0%)	36(4.3%)	91(10.9%)	27(3.2%)	21(2.5%)	834

*Percentage in each class ** Total number of respondents

A significant difference occurs between male and female veterinarians ($\chi^2=31.6$, $p= 0.000$). Significant differences in years from graduation occur less five years and eleven to fifteen years ($\chi^2=10.1$, $p= 0.002$) and more than twenty years ($\chi^2=8.35$, $p= 0.000$), between five to ten years and eleven to fifteen years ($\chi^2=17.1$, $p= 0.002$) and more than twenty years ($\chi^2=19.1$, $p= 0.001$). The difference between principals and associates is significant ($\chi^2=25.2$, $p= 0.000$).

DASS- stress.

Stress scores for veterinarians exceed reference baseline values with few exceptions. Primarily it is only in the extremely severe category that any variation occurs. Twice as many female veterinarians are classified in the extremely severe group than are their male counterparts. Veterinarians with a farm or agricultural enterprise background stress levels reflect more closely the reference baseline data than those with capital city or rural town or city backgrounds. The numbers in each stress category decreases with increasing years from graduation approaching the baseline data after twenty years. For practitioners, companion animal and equine veterinarians have the highest levels of stress. Associate veterinarians are more stressed than practice principals and partners (Table 4).

Table 4 Stress

		DASS Stress categories					Total N**
		Normal*	Mild*	Moderate*	Severe*	Extremely Severe*	
Reference Baseline Data %		78%	9.0%	8.0%	3.0%	2.0%	
All respondents		1324(68.2%)	224(11.5%)	203(10.5%)	133(6.8%)	24(2.4%)	1942
Gender	Male	722(72.4%)	98(9.8%)	92(92.0%)	61(61.0%)	24(2.4%)	997
	Female	602(63.7%)	126(13.3%)	111(11.7%)	72(7.6%)	34(3.6%)	945
Background	Capital City	662(66.0%)	115(11.5%)	113(11.3%)	84(8.4%)	29(3.0%)	1003
	Rural City/Town	384(66.9%)	68(11.8%)	63(11.0%)	36(6.3%)	23(4.0%)	590
	Farm	277(75.9%)	43(11.8%)	26(7.1%)	13(3.6%)	6(1.6%)	365
Years after graduation	< 5years	160(59.9%)	38(14.2%)	29(10.9%)	24(9.0%)	16(6.0%)	267
	5 - 10 years	175(62.1%)	31(11.0%)	37(13.1%)	25(8.7%)	14(5.0%)	282
	11- 15 years	227(70.9%)	38(11.9%)	27(8.4%)	20(6.3%)	8(2.5%)	320
	16 - 20 years	165(66.3%)	32(12.9%)	30(12.0%)	20(8.0%)	2(0.8%)	308
	> 20 years	566(71.3%)	87(11.0%)	79(9.9%)	44(5.5%)	5(1.9%)	824
Type of practice/ work	Companion. Animal	670(65.8%)	125(12.3%)	106(10.4%)	80(7.9%)	37(3.6%)	1018
	Large Animal	23(74.2%)	4(12.9%)	1(3.2%)	3(9.7%)	0(0.0%)	31
	Mixed	298(71.2%)	44(10.5%)	41(9.8%)	25(6.0%)	11(2.6%)	419
	Consultancy/ Specialist	98(77.1%)	10(7.9%)	14(11.1%)	3(2.4%)	2(1.6%)	127
	Equine	55(64.7%)	9(10.6%)	10(11.8%)	8(9.4%)	3(3.5%)	85

	Salaried	170(68.3%)	34(13.0%)	30(11.5%)	14(5.3%)	5(1.9%)	262
Professional relationship	Principal	563(71.2%)	93(11.8%)	72(9.1%)	47(5.9%)	16(2.0%)	791
	Associate	539(64.6%)	96(11.5%)	90(10.8%)	73(8.8%)	36(4.3%)	834

*Percentage in each class ** Total number of respondents

There is a significant difference between male and female veterinarians ($\chi^2=17.4$, $p= 0.002$). Differences occur in background Capital city being significantly different to farm background ($\chi^2=18.7$, $p= 0.001$) and between rural city/town and farm background ($\chi^2=13.2$, $p= 0.010$). Significant differences in years from graduation occurred in less than five years and from eleven to fifteen years after graduation ($\chi^2=19.2$, $p= 0.001$) and with over twenty years after graduation ($\chi^2=38.1$, $p= 0.000$). A significant difference occurs in five to ten years after graduation and more than twenty years ($\chi^2=30$, $p= 0.000$). A significant difference in type of work/ practice occurs between companion animal practitioners and consultancy/specialists ($\chi^2=10.2$, $p= 0.038$). The difference between principals and associates is significant ($\chi^2=14.8$, $p= 0.005$).

Burnout.

Overall the percentage classified as suffering burnout exceeds the reference percentages in all three domains with the one exception being large animal practitioners. The percentage of female veterinarians classified as suffering burnout is twice the reference percentage in all domains. The University of graduation had no detectable effect in the work and client domains but significant differences occur for personal burnout (Table5). Burnout was more pronounced in veterinarians with capital city, rural city or town backgrounds compared to a farm background. With increasing years from graduation the percentage classified with burnout decreases but after twenty years the percentage is still significantly above reference percentages even with the attrition rate of 30 percent described by Heath.

Significant differences occur in the type of practice or work with all exceeding reference percentages except for large animal practitioners (Table5).

Table 5 Copenhagen Burnout Inventory

		CBI categories		
		Personal Burnout*	Work Burnout*	Client Burnout*
Reference Data %		22.2	19.7	16.6
Total N		1945	1946	1933
All respondents		37.0(721)	35.8(687)	24.8(481)
Gender	Male	24.7(246)	26.4(263)	24.8(208)
	Female	50.2(475)	44.7(423)	29.0(273)

University	Queensland	36.3(205)	33.6(190)	25.8(146)
	Melbourne	39.3(148)	36.9(139)	25.8(97)
	Sydney	34.2(192)	33.5(188)	21.1(117)
	Murdoch	41.0(120)	39.1(115)	27.0(77)
	Other	37.8(56)	37.2(55)	27.6(44)
Background	Capital city	37.8(381)	36.6(369)	26.0(260)
	Rural city/town	40.5(232)	38.0(218)	25.7(147)
	Farm	29.6(108)	29.6((108)	20.4(74)
Year after graduation	<5 years	57.7(154)	50.2(56)	36.8(98)
	6-10 years	46.8(132)	45.5(60)	34.6(98)
	11-15 years	41.3(133)	35.4(95)	25.5(82)
	16-20 years	36.1(90)	41.0(102)	24.1(59)
	>20 years ^e	25.7(212)	20.7(211)	17.6((144)
Type of Practice/work	Companion Animal	40.0(407)	39.6(404)	28.5(290)
	Large animal	16.1(5)	12.9((4)	6.5(2)
	Mixed Consultancy/ Specialist	39.5(166)	35.5(149)	22.5(94)
	Equine	23.6(30)	22.8(29)	22.0(28)
	Equine	37.6(32)	32.9(28)	23.5(20)
	Salaried	30.7(81)	27.7(73)	18.6(47)
Professional relationship	Principal	29.8(236)	30.0(238)	19.7(156)
	Associate	46.8(391)	44.0(368)	32.5(271)

*Percentage in each class. The number in brackets is the actual number classified as suffering burnout in each domain.

Personal Burnout – The difference between male and female veterinarians is significant ($\chi^2=62.6$, $p= 0.000$). Veterinarians with a farm background are significantly different to those from capital cities ($\chi^2=4.01$, $p= 0.045$) and those from a rural city/town ($\chi^2=4.51$, $p= 0.034$). Significant differences occur in years from graduation: graduated less than five years is different from eleven to fifteen years ($\chi^2=5.38$, $p= 0.020$), sixteen to twenty years ($\chi^2=19.1$, $p= 0.000$) and more than twenty years ($\chi^2=41.3$, $p= 0.000$), six to ten years is different from sixteen to twenty years ($\chi^2=8.78$, $p= 0.003$) and from more than twenty years ($\chi^2=21.3$, $p= 0.000$), eleven to fifteen years is different from sixteen to twenty years ($\chi^2=4.99$, $p= 0.026$) and more than twenty years ($\chi^2=14.0$, $p= 0.000$). Equine practitioners are significantly different than consultant/specialists ($\chi^2=4.60$, $p= 0.003$).

Work related burnout – A significant difference occurs between male and female veterinarians ($\chi^2=52.9$, $p= 0.000$); Between University of Qld graduates and overseas graduates ($\chi^2=3.02$, $p= 0.000$). For years since graduation significant difference occurs between less than five years and eleven to fifteen years ($\chi^2=5.16$, $p= 0.023$), sixteen to 20 years ($\chi^2=19.1$, $p= 0.00$) and more than twenty years ($\chi^2=41.3$, $p= 0.000$); between eleven to fifteen years and sixteen to twenty years ($\chi^2=21.8$, $p= 0.000$) and more than twenty years ($\chi^2=21.3$, $p= 0.000$); between sixteen to twenty years and more than twenty years ($\chi^2=14.0$, $p= 0.000$). Significant differences within the practice/work groups are between companion animal practitioners and large animal practitioners ($\chi^2=4.89$, $p= 0.027$), consultant/specialists ($\chi^2=6.81$, $p= 0.009$), and salaried veterinarians ($\chi^2=6.01$, $p= 0.014$); and between mixed animal practitioners and consultant specialists ($\chi^2=3.86$, $p= 0.050$). A significant difference occurs between principals and associate veterinarians ($\chi^2=15.7$, $p= 0.000$).

Client related burnout- There is a significant difference between male and female veterinarians ($\chi^2=10.1$, $p= 0.001$). Significant differences in years since graduation occur between less than five years and eleven to fifteen years ($\chi^2=4.43$, $p= 0.035$), sixteen to twenty years ($\chi^2=12.6$, $p= 0.000$) and more than twenty years ($\chi^2=25.6$, $p= 0.000$); between five to ten years and eleven to fifteen years ($\chi^2=141$, $p= 0.000$), sixteen to twenty years ($\chi^2=165$, $p= 0.00$) ($\chi^2=4.60$, $p= 0.003$). and more than twenty years ($\chi^2=256$ $p= 0.000$); and between sixteen to twenty years and more than twenty years ($\chi^2=6.29$, $p= 0.012$). For practice/work significant difference occur between companion animal practitioners and large animal practitioners ($\chi^2=4.90$, $p= 0.027$) and salaried veterinarians ($\chi^2=7.34$, $p= 0.007$). A significant difference occurs between principals and associate veterinarians ($\chi^2=20.1$, $p= 0.000$).

Logistic Regression.

Veterinarians from capital cities (OR 2.6, 95%CI: 1.1-6.1) and rural cities or towns (OR 3.1, .95% CI: 1.3-7.5) were significantly more likely to belong to the highest categories of depression scores (measured by the DASS depression scale) compared to those from rural or agricultural enterprise background (reference category). Veterinarians within ten years of graduation are more likely to belong to the highest categories of stress scores with an OR of

2.7(95%CI: 1.4-5.2) for less than five years and an OR of 2.1 (95%CI: 1.0-4.4) between five and ten years post graduation compared to the reference category of veterinarians over twenty years after graduation.

Table6

Odds Ratios (OR) and confidence interval (CI) for variables found to significantly affect the severe and extremely severe categories of DASS (Stress and Depression) determined by multivariate logistic regression analysis

		DASS (Stress)			DASS (Depression)		
		OR ¹	CI ²	P value	OR	CI	P value
Background	Capital City	-	-	-	2.55	1.07-6.06	0.03
	Rural City/Town	-	-	-	3.07	1.25-7.49	0.01
	Farm	ref	ref	-	ref	ref	-
Years after graduation	< 5years	2.66	1.35-5.24	0.01	-	-	-
	5 - 10 years	2.11	1.01-4.40	0.05	-	-	-
	11- 15 years	1.20	0.51-2.82	0.67	-	-	-
	16 -20 year	0.37	0.08-1.60	0.18	-	-	-
	> 20 years	ref	ref	-	ref	ref	-

¹Odds ratio

²Confidence Interval

³Reference category

Female (OR 1.6, 95%CI:1.2-2.0) and veterinarians within ten years after graduation were both associated with the high and very high K10 scores over 22 compared to the reference category of males and over twenty years post graduation respectively. Female veterinarians (OR 2.3, 95%CI: 1.9-2.9) and veterinarians from a capital city (OR 2.55, 95%CI: 1.1-6.1) and rural city or town (OR 1.4, 95%CI: 1.0-1.9) background were more likely to be associated with high and very high personal burnout scores. Lower work and client burnout scores (OR<1) were associated with all types of practice/ work other than companion animal practice. Veterinarians less than fifteen years post graduation were associated with greater odds of belonging to the high and very high

category of client burnout compared to the reference category of more than twenty years after graduation. The Odds Ratio varied from 2.7(95%CI: 2.0-2.6) for less than five years to 1.5(95%CI: 1.1-2.0) for veterinarians between 11 and fifteen years post graduation.

Table 7

Odds Ratios (OR) and confidence interval (CI) for variables found to significantly affect the high and very high category of Burnout (personal, work and client related) and K10 >50 determined by multivariate logistic regression analysis

		K10			Burnout (personal)			Burnout(work)			Burnout(client)		
		OR ¹	CI ²	P value	OR	CI	P value	OR	CI	P value	OR	CI	P value
Gender	Male	Ref³	ref	-	ref	ref	-	ref	ref	-	ref	ref	-
	Female	1.58	1.23-2.04	0.00	2.32	1.88-2.86	0.00	1.65	1.33-2.03	0.00	-	-	-
Background	Capital City	-	-	-	1.16	0.88-1.52	0.29	1.21	0.92-1.61	0.18	-	-	-
	Rural City/Town	-	-	-	1.38	1.03-1.85	0.03	1.40	1.04-1.88	0.03	-	-	-
Per type of practice/work	Farm Comp.	ref	ref	-	ref	ref	-	ref	ref	-	ref	ref	-
	Animal	ref	ref	-	ref	ref	-	ref	ref	-	ref	ref	-
	Large Animal	-	-	-	-	-	-	0.32	0.11-0.94	0.04	0.19	0.04-0.79	0.02
	Mixed	-	-	-	-	-	-	0.84	0.65-1.09	0.19	0.68	0.52-0.90	0.01
	Other practice	-	-	-	-	-	-	0.55	0.35-0.86	0.01	0.80	0.51-1.26	0.34
Years after graduation	Equine	-	-	-	-	-	-	0.85	0.52-1.39	0.51	0.81	0.48-1.37	0.43
	Salaried	-	-	-	-	-	-	0.72	0.53-0.98	0.04	0.68	0.48-0.97	0.03
	< 5years	1.94	1.39-2.73	0.00	2.64	1.96-3.55	0.00	2.22	1.64-3.01	0.00	2.69	1.99-3.64	0.00
	5 - 10 years	1.47	1.04-2.09	0.03	1.63	1.21-2.20	0.00	1.61	1.19-2.17	0.00	2.19	1.61-2.98	0.00
	11- 15 years	1.30	0.91-1.84	0.15	1.65	1.23-2.21	0.00	1.40	1.04-1.87	0.03	1.49	1.08-2.05	0.02
16 -20 year	1.05	0.71-1.56	0.80	1.45	1.06-1.99	0.02	1.71	1.25-2.34	0.00	1.39	0.98-1.97	0.07	
> 20 years	ref	ref	-	ref	ref	-	ref	ref	-	ref	ref	-	

¹Odds ratio

²Confidence Interval

³Reference category

Discussion.

The aims of this study were twofold, firstly to determine the frequency of non specific psychological distress, to classify that distress into depression, anxiety, stress and burnout in Australian veterinarians and secondly to determine the relationship of the frequencies to the demographic variables of gender, veterinary school, background experience before university, the type of work now performed, and for practitioners the role as principal (partner) or as an associate (assistant). This paper reports the results of a large scale postal survey of all registered veterinarians and demonstrates that veterinarians have higher levels of depression; stress and burnout in comparison to the reference (normative) data however fewer suffer anxiety.

Potential sources of errors in questionnaires include selection bias when the sample is not randomised, non response bias when the response is low and a non-representative sample¹⁶. In this study all eligible participants were included, but the response rate of 27.9% could give rise to a non-response bias. The only demographic data available is from NSW where 44% are female, 43.5% are companion animal practitioners and 16.9% mixed animal¹⁰ compared with 48.6% female, 52.4% companion animal practitioners and 21.6% mixed animal in this study. A comparison of this limited demographic data to the results of this survey shows that any bias in demographic characteristics of the respondents is small.

The Kessler K10, a population measure of psychological distress, has been utilised by both Federal and State jurisdictions in studies and that data can be used to compare with the profession. A Western Australian study of veterinarians using the same groupings produced the following percentages low 47%, moderate 32%, high 17% and very high 5% and for this study 54.3%, 30.8%, 10.2% and 4.8% respectively. The percentage classified as very high is similar in both studies.

The Kessler K10 is a measure of non specific psychological distress and does not differentiate between the negative affective states of depression or anxiety. The DASS self report questionnaire differentiates between depression and anxiety as well as a new third dimension that of stress or tension but defining that state that is the more problematic. The inclusion of stress in the negative affective states is in itself problematic as it frequently precipitates the anxious and depression states even though stressful events give rise to chronic arousal and impaired function¹⁴.

Two periods of increased anxiety were identified. The first in the first five years of graduation when there is uncertainty regarding skills and the application of theoretical knowledge to the practical situation. The next at ten to fifteen years after graduation which coincides with a period of increasing responsibilities of practice ownership and increasing family responsibilities which is especially applicable to female veterinarians.

A number of factors could be related to the higher levels of depression noted in small animal and mixed animal practitioners. These include the human animal bond of clients, client expectations, unexpected outcomes of veterinary care, as well as professional and social isolation and long working hours including on call duties²¹. Equine practitioners were also in this group but at the time of the survey an Equine Influenza epidemic occurred in New South Wales and Queensland. Increased morbidity was noted in similar circumstances in the UK during the 2001 Foot and Mouth Disease epidemic¹⁷.

Graduates who began the course in 1985/86 were asked to self assess their stress levels and 80% reported experiencing stress or burnout ⁷. It has been postulated that there is progression from personal factors related to career choice through the negative effects of undergraduate training and to work related stressors leading to psychological morbidity. The negative effects of undergraduate training have been attributed to curriculum, extramural studies, financial difficulties and psychosocial factors establishing poor coping strategies. In the work environment stressors include long hours, client expectations, inadequate support, emotional exhaustion, unexpected outcomes and perceived low intrinsic and extrinsic rewards all contribute to career disenchantment. These stressors give rise to feelings of entrapment, depression, cognitive distortion, negative thoughts about the self, ruminative thinking and hopelessness ¹⁸. To compound this is a false belief of coping and a perceived stigma in seeking help. The emotional exhaustion and disenchantment with career choice can be features of both the depression and burnout constructs; the former being related to varied pre-determinants but the latter the result of workplace stressors. The depression and burnout constructs overlap and are related, with major depressive episodes frequently involving the burnout experience. This overlap necessitates, where they occur concurrently interventions at the personal level and in the workplace.

Burnout results from chronic workplace stress and for an undergraduate the university can be considered to be the workplace. The high percentage of burnout (55%) noted in the first five years after graduation could be partially the result of stress as a student. A study of medical graduates found 39% were classified as suffering burnout at graduation increasing to 75% during internship years as assessed by the Maslach Burnout Inventory ¹⁹. For veterinarians as the years after graduation increase the percentage classified as suffering burnout decreases and even after a significant number have left the profession it still remains 25% above the reference data for personal burnout although work and client burnout approach the reference data percentages. A similar finding of decreasing burnout with increasing years from graduation occurred in veterinarians in Finland ²

The veterinary undergraduate course has been described as having the potential to stifle communication skills and emotional intelligence ¹⁸. It follows that if communication, coping and cognitive skills were included in the curriculum then depression, anxiety, stress and burnout could be reduced in graduates. Burnout is frequently attributed to the individual but is a result of work place stress and therefore primarily a problem of the workplace where management changes and individual skills training are required to fully address this issue.

Veterinarians whose formative years were in a farm or agricultural enterprise environment are consistently more often in the lower categories for all measurements. The reason is not evident from this study but these backgrounds may produce a clearer understanding of the cycle of life and possess greater coping skills. The nature of the client/work relationship of large animal practitioners differs in the time spent with individual clients (herd problems, obstetric cases etc) than occurs in other types of practice resulting in long term friendships and relationships with the animals owners.

Further research is needed to clarify many of the issues identified. A longitudinal study using validated measurement techniques extending from matriculation through university years and into the veterinary career would clarify the issues. Such a study would ideally be of the lifespan but a minimum of twenty five years would be valuable but would require the commitment of a research organisation. Specifically targeting high risk or high occurrence groups could provide causal information and techniques to manage the issues.

Conclusion

Veterinarians as a group are over represented for psychological distress and more specifically for depression and stress states as defined by the DASS but not for anxiety when compared to the normative data. The main determinants of depression, stress and burnout are female gender, years after graduation, and being a companion animal, mixed or equine veterinary practitioner or an associate in a veterinary practice.

These findings suggest that the absence of communication, coping and cognitive skills training from a course primarily focussed on the acquisition of veterinary skills may initiate the process of burnout and poor mental health. While further research is needed to verify this conclusion, it is probable that if appropriate communication, coping and cognitive skills were provided to undergraduate and graduate veterinarians then depression, stress and burnout would be reduced.

Acknowledgements.

Thank you to the registrars of the veterinary boards who provided the veterinary rolls used to compile the mailing lists. A thankyou is also extended to the veterinary pharmaceutical companies, namely Apex Laboratories Pty Ltd, Boehringer Ingelheim Pty Ltd, Norbrook Laboratories and Bayer Australia Ltd who kindly provided funding for this project.

References

1. Elkins AD, Kearney M. Professional burnout among female veterinarians in the United States. *Journal of the American Veterinary Medical Association* 1992;200:604-608.
2. Reijula K, Rasanen K, Hamalainen M, et al. Work environment and occupational health of Finnish veterinarians. *American Journal of Industrial Medicine* 2003;44:46-57.
3. Hansez I, Schins F, Rollin F. Occupational stress, work-home interference and burnout among Belgian veterinary practitioners. *Irish Veterinary Journal* 2008;61:233-241.
4. Meehan M, Bradley L. Identifying and evaluating job stress within the Australian small animal veterinary profession. *Australian Veterinary Practitioner* 2007;27:70-83.
5. Fritschi L, Morrison D, Shirangi A, Day L. Psychological well-being of Australian veterinarians. *Australian Veterinary Journal* 2009;87:76-81.
6. Furukawa TA, Kessler RC, Slade T, Andrews G. The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-Being. *Psychological Medicine* 2003;33:357-362.
7. Heath T. *Career paths of Australian veterinarians*. Post graduate foundation in veterinary science of the University of Sydney, 2001.
8. Borritz M, Rugulies R, Bjorner J, et al. Burnout among employees in human service work: design and baseline findings of the PUMA study. *Scandinavian Journal of Public Health* 2006;34:49-58.
9. Maslach C, Leiter M. *The Truth About Burnout: how organisations cause personal burnout and what to do about it*. Jossey-Boss Inc, 1997.
10. Stastical Information. *Boardtalk*. Veterinary Practitioners Board of NSW, 2008:7-12.
11. Kessler RC, Barker PR, Colpe LJ, et al. Screening for Serious Mental Illness in the General Population. *Archives of General Psychiatry* 2003;60:184-189.
12. Australian Bureau of Statistics. Information Paper: Use of the Kessler Psychological Distress Scale in ABS Health Surveys, Australia. www.abs.gov.au/Ausstats/abs@.nsf/mf/4817.0.55.001. 2008. Retrieved 11 March 2008.
13. Baillie AJ. Predictive gender and education bias in Kessler's psychological distress scale (K10). *Social Psychiatry and Psychiatric Epidemiology* 2005;40:743-748.
14. Lovibond S, Lovibond P. *Manual for the depression anxiety stress scales*. 2nd edn. Psychology Foundation Monograph, 2004.

15. Kristensen TS, Borritz M, Villadsen E, Christensen K. The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. *Work and Stress* 2005;19:192-207.
16. Dillman D. The design and administration of mail surveys. *Annual review of Sociology* 1991;17:225-249.
17. Convery I, Mort M, Bailey C, Baxter J. Role stress in front line workers during the 2001 Foot and Mouth disease epidemic: The value of therapeutic spaces. *The Australasian Journal of Disaster and Truma Studies* 2007;2007-2.
18. Bartram D, Baldwin D. Veterinary surgeons and suicide: influences, opportunities and research directions. *Veterinary Record* 2008:36-40.
19. Wilcock S, Daly M, Tennant C, Allard B. Burnout and psychiatric morbidity in new medical graduates. *Medical Journal of Australia* 2004;181:357-360.